

# **Local Fiscal Capacity for Funding Education in Tennessee**

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**[www.state.tn.us/tacir](http://www.state.tn.us/tacir)**

## Local Fiscal Effort

Represents what school systems **are doing** to fund education.



## Local Fiscal Capacity

Represents what school systems **can do** based on relevant community characteristics:

- ♦ *Tax base*
- ♦ *Income*
- ♦ *Tax burden*
- ♦ *School Population*

# **TACIR Fiscal Capacity Model**

## ***What is it?***

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- **A Modified Representative Tax System Approach**  
(Regression Weighted)
- **A Pupil Equity Model**—measured by the tax base per student
- **A Taxpayer Equity Model**—measured by
  - ♦ Ability to pay
  - ♦ Resident tax burden
  - ♦ Tax exportability
- **A Fiscal “Behavioral” Model**
  - *Does not set normative standards for local revenue.*
  - *Accepts actual levels of local revenue as basis for measuring fiscal capacity.*
- **Three-year Moving Average**—mitigates both errors and volatility in the data

# ***Basic Education Program Formula Equalization***

## **Fiscal Capacity Model Components and Factors**

### **Components**

### **Factors**

Local Revenue



*Own-source Revenue per Pupil*

Tax Base  
(*Pupil Equity*)



▪ *Taxable Sales per Pupil*



▪ *Property per Pupil*

Ability to Pay  
(*Taxpayer Equity*)



▪ *Per Capita Income*

Resident Tax Burden  
(*Taxpayer Equity*)



*Ratio of Residential & Farm  
Assessment to Total Assessment*

Service Responsibility  
(*Pupil Equity*)



*Ratio of Average Daily  
Membership to Population*

Methodology



*Ordinary Least Squares Multiple  
Linear Regression*

Output



*Fiscal Capacity per Pupil*

# **Effect of Changes in Fiscal Capacity Factors**

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*The relationship between fiscal capacity and specific variables (other things being equal) is illustrated as follows:*

**Property Assessment Increases    ↑    Fiscal Capacity Increases    ↑**

**Taxable Sales Increase                    ↑    Fiscal Capacity Increases    ↑**

**Per Capita Income Increases            ↑    Fiscal Capacity Increases    ↑**

**Tax Burden Ratio Increases            ↑    Fiscal Capacity Decreases    ↓**

**ADM/Population Ratio Increases    ↑    Fiscal Capacity Decreases    ↓**

# How to Compute the Fiscal Capacity Index

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- Step 1.** Calculate the county's fiscal capacity per pupil  
(determined by TACIR Model)
- Step 2.** Multiply the county's fiscal capacity per pupil from **Step 1** by the total number of students (ADM) in the county to get county total fiscal capacity
- Step 3.** Add the total fiscal capacity determined in **Step 2** for all 95 counties together to get the total statewide fiscal capacity
- Step 4.** Divide each county's total fiscal capacity from **Step 2** by the total statewide fiscal capacity from **Step 3** and multiply the result by 100 to get the fiscal capacity index, e.g.,

$$275,000,000 \div 2,000,000,000 \equiv 0.137500 \times 100 \equiv 13.75\%$$

## **From Fiscal Capacity to Local BEP Match Requirement** ***They're Not the Same Thing!***

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What you need to know to figure out your county's local matching requirement:

1. Your county's percent of total fiscal capacity (fiscal capacity index or FCI)
2. The total (state and local combined) cost of the BEP formula—**statewide!**
3. The statutory local match rate (e.g., 35% for instructional positions, 25% for other classroom components and 50% for non-classroom components)

Multiply these three things together, and the result is your local matching requirement—the total dollar amount the school system (or systems) in your county must contribute in order to get all of the state dollars to which you're entitled under the BEP formula. For example,

\$ 2,651,415,000	Total BEP for Instructional Positions
	<i>(Based on Dept. of Education April 2004 estimate for FY2004-05.)</i>
x	35% Statutory Local Match Rate
x	0.5213% Volunteer County Fiscal Capacity
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\$ 4,838,000	Volunteer County Local Match

That is what your county has to pay, and the state makes up the difference: the total cost of the BEP calculated for your students minus your local matching requirement.

# **From Fiscal Capacity to Local BEP Match Requirement** ***What Effect Do Changes In the BEP Formula*** ***Have on My Local Match Rate?*** ---

**Compare the current year to next year\*:**

		<b>FY 2003-04</b>		<b>FY 2004-05</b>
<b>Total BEP Instructional Cost</b>		<b>\$2,182,962,000</b>		<b>\$2,651,415,000</b>
<b>Statutory Match Rate</b>	<b>x</b>	<b>25%</b>	<b>x</b>	<b>35%</b>
<b>Aggregate Local Share</b>	<b>=</b>	<b>\$545,740,500</b>	<b>=</b>	<b>\$927,995,250</b>
<b>Vol. Co. Fiscal Capacity</b>	<b>x</b>	<b>0.5247%</b>	<b>x</b>	<b>0.5213%</b>
<b>Vol. Co. Local Share</b>	<b>=</b>	<b>\$2,863,500</b>	<b>=</b>	<b>\$4,837,639</b>

**Subtract that from Vol. Co.'s BEP Instructional cost:**

		<b>FY 2003-04</b>		<b>FY 2004-05</b>
<b>Vol. Co. BEP Instructional Cost</b>		<b>\$11,685,000</b>		<b>\$14,466,000</b>
<b>Vol. Co. Local Share</b>	<b>-</b>	<b>2,864,000</b>	<b>-</b>	<b>4,838,000</b>
<b>Vol. Co. State Share</b>		<b>\$8,821,000</b>		<b>\$9,628,000</b>
<b>Vol. Co. Match Rate</b>		<b>24.51%</b>		<b>33.44%</b>

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\* Based on Dept. of Education April 2004 estimate for FY2004-05.



# ***Compensatory Effect of BEP Equalization***

## **Comparison of ADM, Fiscal Capacity and State BEP Funding for County Quintiles**

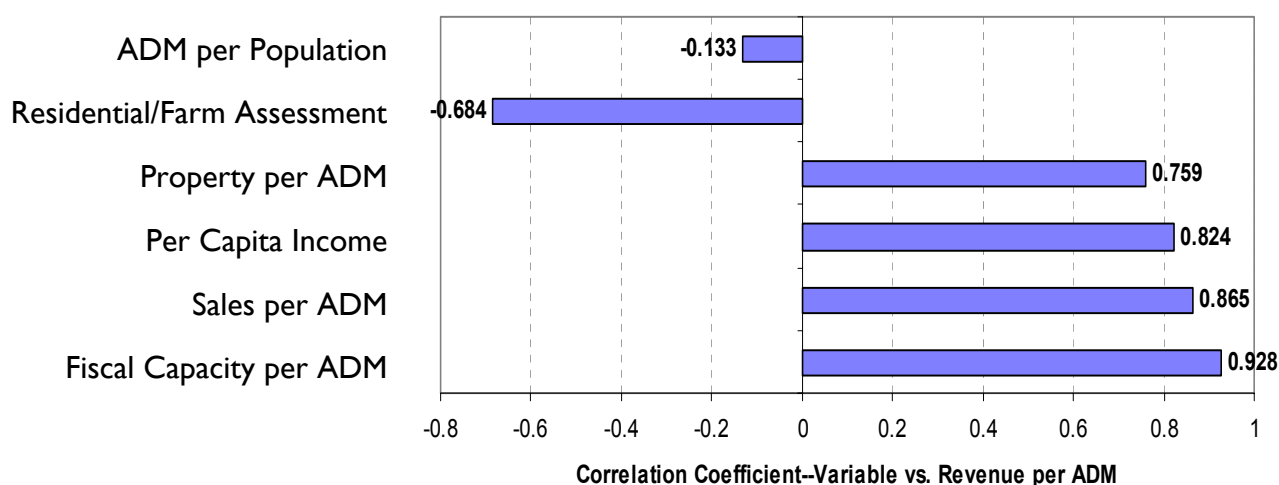
<b>County Quintiles*</b>	<b>Total ADM</b>	<b>Total Fiscal Capacity (in thousands)</b>	<b>State BEP Funding (in thousands)</b>	<b>Capacity ÷ ADM</b> [ratio between Capacity % and ADM %]	<b>State \$ ÷ ADM</b> [ratio between State BEP % and ADM %]
<b>First</b> <i>Percent of total</i>	577,146 64.12%	\$1,666,619 78.22%	\$1,516,776 56.84%	\$2,888 <b>1.22</b>	\$2,628 <b>0.89</b>
<b>Second</b> <i>Percent of total</i>	145,014 16.11%	236,487 11.10%	490,845 18.39%	\$1,631 <b>0.69</b>	\$3,385 <b>1.14</b>
<b>Third</b> <i>Percent of total</i>	89,987 10.00%	133,986 6.29%	313,001 11.73%	\$1,489 <b>0.63</b>	\$3,478 <b>1.17</b>
<b>Fourth</b> <i>Percent of total</i>	56,164 6.24%	66,169 3.11%	214,042 8.02%	\$1,178 <b>0.50</b>	\$3,811 <b>1.29</b>
<b>Fifth</b> <i>Percent of total</i>	31,841 3.54%	27,349 1.28%	133,791 5.01%	\$859 <b>0.36</b>	\$4,202 <b>1.42</b>
<b>Statewide</b> <i>Percent of total</i>	900,152 100.00%	\$2,130,607 100.00%	\$2,6685,455 100.00%	\$2,367 <b>1.00</b>	\$2,964 <b>1.00</b>

\* Counties grouped in order of total fiscal capacity, highest to lowest.

# Correlation Analysis

## *Relationship between Local Revenue per Pupil and Fiscal Capacity Variables for FY 2005*

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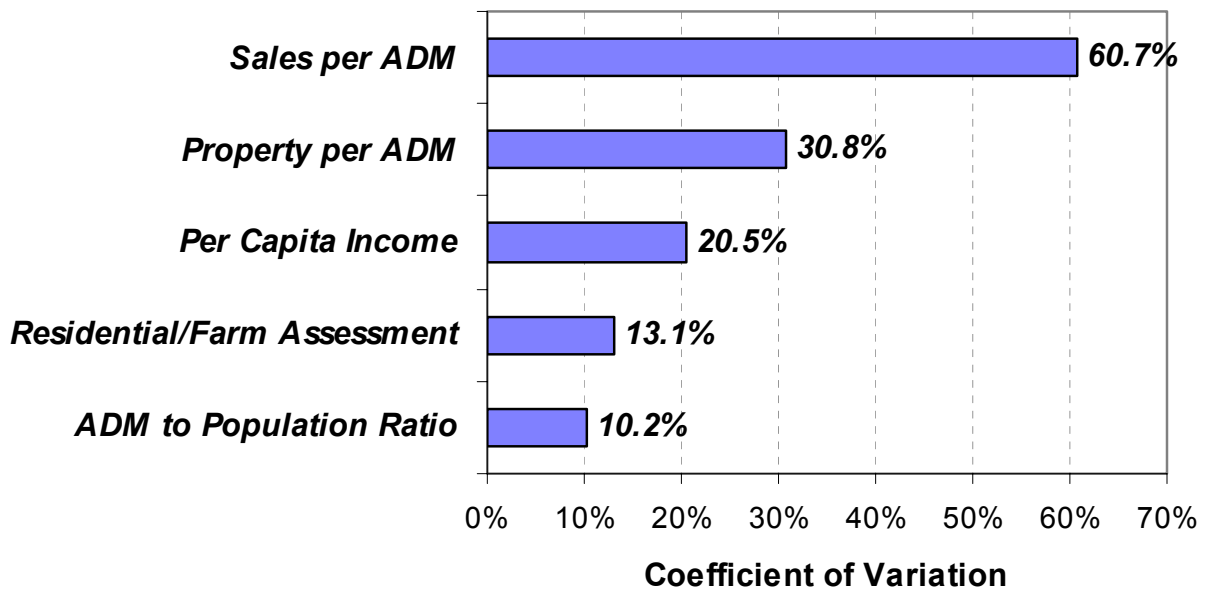
## Correlation Analysis

Correlation analysis is a descriptive technique used to measure the strength of the relationship between two variables. The statistic produced is called the coefficient of correlation. Values for the coefficient of correlation range from -1 for a perfect negative correlation up to +1 for a perfect positive correlation. *Perfect* means that if all the points of intersection between a pair of variables were plotted in a scatter diagram, all the points could be connected with a straight line. The closer the coefficient to either +1 or -1, the stronger the relationship. When the coefficient is near zero, little or no relationship exists. In the chart above, the longer the bars, the stronger the relationship. The factors are in order, top to bottom, from weakest to strongest. The factor with the strongest relationship to revenue per pupil is sales per ADM. The correlation coefficient for those two variables is 0.865. Per capita income and property per ADM also have strong relationships to revenue per pupil (0.824 and 0.759 respectively). The existence of a strong correlation does not imply a causation effect; it only indicates the tendencies present in the data.

# Dispersion of Variables FY 2005

## *Coefficient of Variation*

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### ***Variation Analysis***

The coefficient of variation (COV) is a measure of the variation from the average value for a single variable or factor. Technically, it is the standard deviation expressed as a percent of the mean. The large COV for taxable sales indicates very large differences in taxable sales per pupil across the ninety-five counties. The COV for sales is almost double the COV for property, indicating considerably larger differences across counties in their sales tax bases than in their property tax bases. The small COV for ADM per population indicates relatively small differences across the counties for this factor. This comparison indicates that differences among counties in their tax bases are far more significant than differences in school enrollment relative to their population.

# Frequently Asked Questions About Fiscal Capacity

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**1. What is fiscal capacity?**

Fiscal capacity is the potential ability of local governments to fund education from their own taxable sources, relative to the cost of their service responsibility.

**2. What factors determine fiscal capacity?**

Essentially, fiscal capacity is determined by the following factors for each of the 95 counties: fiscal effort, tax capacity based on property and sales, ability to pay based on per capita income, tax burden, and service responsibility based on school population as a percent of total population.

**3. What is the actual output of TACIR's fiscal capacity formula?**

The TACIR formula measures the per pupil dollar amount that each county—based on the characteristics explained in item 2 above—can afford to pay to fund education.

**4. What is the method for determining fiscal capacity?**

Essentially, the fiscal capacity model is based on a set of averages. The method, which is called multiple regression analysis, takes one factor (variable) at a time and compares it for all counties. From this process, an average weight (called a coefficient) is calculated for each factor. For the property and sales bases, this coefficient is equivalent to an average tax rate.

**5. What is multiple regression analysis?**

This is a very common and eminently useful statistical method for addressing a wide range of issues. This procedure is used to predict the value of fiscal capacity based on a number of factors that determine fiscal capacity.

**6. How is the per pupil fiscal capacity actually calculated?**

As indicated above, the statistical method produces an average weight (called a coefficient) for each of the factors in the model. These averages are multiplied by the value of each factor for each county and summed. This produces a per pupil fiscal capacity amount. These per pupil amounts will vary county-by-county because the factor values are different for each county.

**7. What are the timing implications of fiscal capacity?**

Because of a time lag in the collection and publication of official statistics, the data is frequently 18 to 24 months old. Moreover, the formula is based on a 3-year “moving” average of the data used. That means that each year the formula is calculated, the most

current year is added and the oldest year is dropped. Consequently, a current change in the tax base of any county will not be reflected in the most current fiscal capacity index.

**8. Will the fiscal capacity of each county change each year?**

It is likely that there will be some change each year. However, experience shows that for most counties the changes are insignificant. The influence of a change in the tax base in a specific county will be related to similar tax changes in other counties. A change in any specific fiscal capacity factor will not necessarily mean a change in fiscal capacity.

**9. What is the fiscal capacity index (FCI)?**

The State Board and Department of Education use a percent of total measure of fiscal capacity rather than a per pupil measure. Once TACIR determines per pupil capacity for each county, this value is multiplied by average daily membership. This produces a countywide measure of total fiscal capacity. The values of the 95 counties are summed, and each county is expressed as a proportion of the total. The fiscal capacity index for each county is this proportion.

**10. Is the FCI the same thing as my local BEP match rate?**

No. Your local match rate is the result of multiplying your fiscal capacity index by the total (statewide) local share of the Basic Education Program (a dollar amount) and then dividing the result (the amount of the BEP your county area must fund) by the total dollar amount generated for your county by the BEP formula. The total (statewide) local share of the BEP is a dollar amount that results from multiplying the statutory match rate (e.g., 50% of the non-classroom components) by the total dollar amount generated for all school systems by the BEP formula.

**11. Can per pupil fiscal capacity change without affecting the index?**

Yes. The per pupil capacity of a specific county can move up or down without necessarily causing a major change in the index. However, this depends on what changes occur in all 95 counties.

**12. How does the Fiscal Capacity Index influence the local share of each county for funding the Basic Education Program?**

The index is the portion of total fiscal capacity for which each county has responsibility. If county A has an index of 3.45% in FY 2004, then county A is responsible for 3.45% of the total local share (in dollars) of the BEP. The total local share depends on the total cost of the BEP and the local match rate set in statute. If a county's index goes up, or down, that county's share of responsibility changes. Changes in the fiscal capacity index have much less effect on funding than do changes in the local match rate set in statute or changes in the total cost of the BEP.

## **From Fiscal Capacity to Local BEP Match Requirement** ***Where Does the Local Match Rate Come In?***

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There are only two situations in which you need to know your local match rate:

- 1. There is more than one school system in your county.***
- 2. You're curious.***

To calculate any county's local match rate for the BEP,

***divide the county's matching requirement in dollars by the total cost of the BEP for that county.***

*Do this for each part of the BEP (instructional positions, other classroom components, non-classroom components) separately to get the county's local match rates. Then the local match rates can then be multiplied by the total cost of the BEP for each system in the county to get its own matching requirement (in dollars) and the total amount of state funds to which it is entitled under the BEP formula.*

***OR***

To determine the local matching requirement for each system within a county *without knowing the county's match rate*,

***divide the county's matching requirement among the systems based on each system's share of the total cost of the BEP for the county.***

*Do this for each part of the BEP (instructional positions, other classroom components, non-classroom components) separately. The result is the same as if you had calculated the county match rates and applied them to each system's total BEP cost. **No match rate required.***

# How Fiscal Capacity Works in the BEP Formula\*

## (sample calculation based on current formula)

- Step 1. Compute the cost of the Basic Education Program [BEP], component by component
- Step 2. Tally up the total cost [state and local combined] of instructional positions, the other classroom components and the non-classroom components:

▪ Grand Total Instructional Positions	\$2,651,415,000
▪ Grand Total Other Classroom Components	\$ 460,455,000
▪ Grand Total Non-classroom Components	\$1,199,416,000

- Step 3. Divide responsibility between the State and local school systems:

	Required State Percentage	State Share	Local Share	Grand Total
Instr. Positions	65%	\$1,723,414,000	\$ 928,001,000	\$2,651,415,000
Other Classroom	75%	345,338,000	115,117,000	460,455,000
Non-classroom	50%	599,703,000	599,713,000	1,199,416,000
All Components	n/a	\$2,668,455,000	\$1,642,831,000	\$4,311,286,000

- Step 4. Determine county area share of local education fiscal capacity [see attached]:

- Estimated Total County Area Local Education Fiscal Capacity—TACIR fiscal capacity per student for each county area multiplied by number of students [three-year average daily attendance (ADM)] in public schools in that county
- County Area Percent of Grand Total Estimated Local Education Fiscal Capacity—estimated total county area fiscal capacity divided by grand total for all counties expressed as a percentage of the statewide total

- Step 5. Divide responsibility for the local share [from Step 3] among the counties—multiply the total statewide local share of each part of the BEP [instructional, other classroom and non-classroom separately] by each county area's percentage share of fiscal capacity [from Step 4]:

VOLUNTEER CO.	Instructional Positions	Other Classroom	Non-classroom	Total
Statewide Local Share	\$928,001,000	\$115,117,000	\$599,713,000	\$1,642,831,000
County Area Fiscal Capacity	<u>x 0.5213%</u>	<u>x 0.5213%</u>	<u>x 0.5213%</u>	n/a
County Area Local Share [local funding requirement]	\$ 4,838,000	\$ 600,000	\$3,126,000	\$ 8,564,000

**IF COUNTY HAS ONLY ONE SCHOOL SYSTEM, STOP HERE.**

\* All figures based on final FY03 allocations by Tennessee Department of Education, Office of Local Finance.

**IF COUNTY HAS MORE THAN ONE SCHOOL SYSTEM, CONTINUE FROM STEP 5.**

<b>TRINITY CO.—Step #5</b>	<b>Instructional Positions</b>	<b>Other Classroom</b>	<b>Non-classroom</b>	<b>Total</b>
<b>Statewide Local Share</b>	\$928,001,000	\$115,117,000	\$599,713,000	\$1,642,831,000
<b>County Area Fiscal Capacity</b>	<u>X 1.2255%</u>	<u>X 1.2255%</u>	<u>X 1.2255%</u>	n/a
<b>County Area Local Share</b> [local funding requirement]	\$ 11,373,000	\$ 1,411,000	\$ 7,349,000	\$ 20,133,000

Step 6. **IF COUNTY HAS MORE THAN ONE SCHOOL SYSTEM**, then for instructional positions, other classroom and non-classroom funding separately, (1) tally up the total BEP funding [state and local combined] for each school system within the county, (2) compute the percent of the county total for each system by dividing each system's total BEP funding by the county area total, and (3) multiply the county area local share [i.e., the local funding requirement for the entire county] from Step 5 by each system's percent of the county total BEP funding:

<b>TRINITY CO.</b> <i>Instructional Positions Funding</i>	<b>Total BEP Funding Requirement</b> [state and local combined]	<b>Percent of County Total</b> [calculated from previous column]	<b>Local Funding Requirement</b> [split based on previous column]
<b>Trinity Co.</b>	\$20,286,000	60%	\$6,824,000
<b>Polk City</b>	5,072,000	15%	1,706,000
<b>Best SSD</b>	8,452,000	25%	2,843,000
<b>County Area Total</b>	\$33,810,000	100%	\$11,373,000

<b>TRINITY CO.</b> <i>Other Classroom Funding</i>	<b>Total BEP Funding Requirement</b> [state and local combined]	<b>Percent of County Total</b> [calculated from previous column]	<b>Local Funding Requirement</b> [split based on previous column]
<b>Trinity Co.</b>	\$3,555,000	60%	\$ 847,000
<b>Polk City</b>	889,000	15%	212,000
<b>Best SSD</b>	1,481,000	25%	353,000
<b>County Area Total</b>	\$5,925,000	100%	\$1,411,000

<b>TRINITY CO.</b> <i>Non-classroom Funding</i>	<b>Total BEP Funding Requirement</b> [state and local combined]	<b>Percent of County Total</b> [calculated from previous column]	<b>Local Funding Requirement</b> [split based on previous column]
<b>Trinity Co.</b>	\$10,017,000	65%	\$4,777,000
<b>Polk City</b>	1,849,000	12%	1,102,000
<b>Best SSD</b>	3,545,000	23%	1,690,000
<b>County Area Total</b>	\$15,411,000	100%	\$7,349,000



## **From Fiscal Capacity to Local BEP Match Requirement**

### ***What Effect Do Changes In Fiscal Capacity Have on My Local Match Rate?***

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For most counties, changes in fiscal capacity are relatively small from year to year. Trends are usually fairly predictable based on economic growth and growth in the student population:

- ♦ If the county's economy and student populations are growing at about the same rate, then fiscal capacity will be fairly stable.
- ♦ If the economy and the student population are growing at different rates, then fiscal capacity may go up or down:
  - *If the economy is growing faster than the student population, then fiscal capacity will likely increase.*
  - *If the economy is growing slower than the student population, then fiscal capacity will likely decrease.*

Exactly what happens in one county depends on how its growth rates compare to all other counties.

**Because most changes in fiscal capacity from year to year are small, most changes in the local match rate are also small. **BUT** big changes in the BEP can cause big changes in the local match rate.**

## **From Fiscal Capacity to Local BEP Match Requirement**

### ***What Effect Do Changes In the BEP Formula Have on My Local Match Rate?***

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- ◆ Changes in the BEP that affect all systems similarly have little effect on local match rates. *Examples include the cost of textbooks or other supplies and materials, the cost of positions, including both salaries and benefits (retirement, social security, insurance).*

**Why?** Because each system's share of the total BEP remains about the same. When a county's share of the BEP stays about the same and its fiscal capacity index (its share of total capacity) stays about the same, **its match rate stays about the same.**

- ◆ Changes in the BEP that affect different systems differently have greater effect on local match rates. *Examples include changing staff ratios for special groups of student that are not evenly distributed across the state (at risk students, English language learners, high-cost special education students).*

**Why?** Because each system's share of the total BEP goes up or down depending on whether and how much it gains from such changes. When a county's share of the BEP changes and its fiscal capacity index (its share of total capacity) stays about the same, **its match rate changes.**

- ◆ *If the county's share of the BEP goes up and its fiscal capacity stays the same, its match rate goes down.*
- ◆ *If the county's share of the BEP goes down and its fiscal capacity stays the same, its match rate goes up.*

**And if the statewide match rate changes, every county's match rate changes.**

## Glossary

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**Ability to Pay**—the ability of individuals in a certain jurisdiction to pay taxes relative to those in other jurisdictions, generally based on a measure of income. The TACIR school system fiscal capacity model uses county per capita income and school district poverty rates, which are based on income, to measure ability to pay.

**Fiscal Capacity**—the potential ability of the school systems' to raise revenues from their own sources to pay for public education.

**Fiscal Effort**—the degree to which a school system utilizes the revenue bases available to it, typically measured as the ratio of between the actual amount of revenues collected or used for a particular purpose to a related measure of fiscal capacity.

**Local Revenue**—the amount of money provided at the discretion of local officials to support school systems, such as property taxes, and state-shared tax revenues that substitute for local revenue.

**Ordinary Least Squares Multiple Linear Regression**—a statistical process used to predict the values of a dependent variable, such as local revenue for education, based on the values of a set of explanatory variables, called independent variables.

**Per Capita Income**—income received by persons from all sources for a given geographic area divided by the population of that area; income includes compensation of employees (received), proprietors' income, rental income, income receipts on assets, and current transfer receipts less contributions for government social insurance.

**Property per Pupil**—the equalized assessed valuation of property subject to taxation by local officials divided by the number of students in average daily membership.

**Representative Tax System**—as a measure of fiscal capacity, a method of calculating the amount of revenue that a region or government would collect if it were to exert average fiscal effort; hypothetical tax system that is representative or typical of all the taxes actually levied by the state and local governments of a federation intended to be descriptive of the state-local tax system.

**Resident Tax Burden**—the portion of property tax payments for which owners of homes and farms are responsible; the equalized assessed valuation of residential and farm property divided by the total taxable value of all property.

**Sales per Pupil**—the value of all sales subject to taxation by cities and counties divided by the number of students in average daily membership.

**Service Burden**—the cost of providing for public education.

# **Data Sources for the FY 2005 Fiscal Capacity Model**

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## **Local Revenue**

Tennessee Department of Education, Annual Financial Reports from public school systems, fiscal years 2000-01 through 2002-03.

## **Student Counts—Average Daily Membership**

Tennessee Department of Education, Annual Statistical Reports for school years 1999-2000 through 2001-02. <http://www.state.tn.us/education/mreport.htm>

## **County Population Estimates**

U.S. Census Bureau, Population Division, Tennessee County Population Estimates, July 1, 2000 through 2002. <http://eire.census.gov/popest/data/counties/tables/CO-EST2002/CO-EST2002-01-47.php>

## **Per Capita Income**

U.S. Bureau of Economic Analysis, Regional Economic Analysis Division, annual estimates for counties, metro, and BEA economic areas, including employment, 1999-2001. <http://www.bea.doc.gov/bea/regional/reis/>

## **Local Sales Tax Base**

Tennessee Department of Revenue, fiscal years 1999-2000 through 2001-02.

## **Property Tax Base, Appraisal Ratios and Ratio of Residential and Farm Assessment to Total Assessment**

Tennessee Board of Equalization, *Tax Aggregate Report of Tennessee*, calendar years 2000 through 2002. <http://www.comptroller.state.tn.us/pa/taxaggr.htm>

## **Tax Equivalent Payments**

*County and Municipal Finances*, Division of Local Finance, Comptroller of the Treasury, fiscal years ending June 30, 1993 through 1995.